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ABSTRACT

This position paper presents an interdisciplinary approach to the study of population. Six main sections are included in the paper: Introduction, The Growth of the Human Population, The Psychological Effects of Population Growth, Overpopulated America, Myths Concerning Population Growth and Control, and Population Education. Section 1, an introduction, opens the paper with an example of population growth in the Aztec society. Section 2 traces the history of population growth and man's steady removal of predators and diseases which once limited population growth. Section 3 examines the effects of overpopulation in relationship to basic characteristics of man. Overpopulated America, Section 4, looks at the history, present status, and future problem of population growth in America. Section 5 discusses such topics as space migration, immigration on earth, and the green revolution. The last section focuses on population education. This section includes guidelines for an interdisciplinary course, a minicourse, an episode, possible population programs, two plays, and a population survey. The paper also contains a bibliography including readings, films, filmstrips, slides, and organizations and agencies. (TK)

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POPULLUTION:

A POSITION PAPER ON POPULATION

by

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GLOSSARY

1. birth control - the limiting of the size of a family through contraception

2. carrying capacity - the maximum number of a species which a certain territory will support through the most critical period of the year

3. crude birth rate - the total number of births each year per 1,000 persons of a population

4. death rate - the total number of deaths each year per 1,000 persons of a population

5. demographic transition - a change in the population due to decreases or increases in the birth rate or the death rate

6. demography - the study of human populations - their size, distribution, behavior, make-up, and patterns of movement

7. fecundity - the ability of a woman (or couple) to have children at a future time

8. fertility rate - the number of children born to women of child bearing age, 15 to 44 years

9. growth rate - increase or decrease in a population during a year (expressed as a percentage of the original population), as determined by natural increase or decrease and net migration

10. infant mortality rate - ratio of infant deaths in a given year to live birth in the same year (infant refers to children under one year of age)

11. life expectancy - under given mortality conditions, the average number of years of life remaining to males or females of a specified age

12. Malthusian Theory - Thomas Robert Malthus' principle of population which states that the power of population is greater than the power of the earth to produce food and that while food increases in arithmetical ratio (1,2,3,4,5,6,7,8,9...), population when unchecked increases in geometrical ratio (1,2,4,8,16,32,64,128,256...) - Malthus also believed the population would be held in check by "misery and vice."

13. natural increase - the difference between the birth rate and the death rate; the growth rate excluding immigration

14. pollution - man-produced wastes that lower the quality of the environment

15. population - the number of individuals of a certain species that live in a particular area at a certain time

16. population control - any humane program to regulate the size of the human population to achieve the goal of a stable world population by a society

17. replacement level - two children per couple, one child to replace each parent

18. zero population growth - a balance between the birth rate and death rate, so that each person who dies is replaced by another. To achieve zero growth, families in the population should have an average of about 2.11 children.

INTRODUCTION

Population growth is of prime importance since it is the basic cause of our present imbalance with nature. When the human population begins to grow uncontrolled, the entire environment is affected. The study of populations focuses upon the social community, whether it be one specific community or the whole world as a massive social community. A study of any human society is based upon data from the sociologist, the anthropologist, the political scientist, the demographer, the geographer, the historian, and the economist, along with those scholars in all the other related science disciplines. All disciplines are needed in order to get a full view of the interplay between man and the environment. A population, its growth patterns and its attitudes, determine the condition of the environment.

George W. Carey and Julie Schwartzberg in their book, Teaching Population Geography, give a perfect example of the relationship between population growth and the environment. During the Aztec period a condition of equilibrium - or balance of population with resources - seems to have prevailed in the Valley of Central Mexico. The Aztecs lived on a series of islands in the midst of Lake Texcoco and along the shore. Many of the islands had been made by the Aztecs by sinking mud and wicker rafts one on top of another until they were above the water level. These islands were used to raise agricultural produce. Since the lake was saline, fresh water was brought along an earthwork causeway from Chapultepec to the main islands. Human wastes from the city and villages, instead of being permitted to pollute the lake, were collected, sun-dried, purified, and used as fertilizer.

The Aztec society maintained their balance with the environment by keeping their population growth under control. This was done primarily through their religious observances which demanded human sacrifice. Aztec cities constantly engaged in warfare for the purpose of gaining captives to sacrifice. Many young men died or were captured and sacrificed. Many youths died before procreating - the right to bear arms was granted at sixteen years of age, but the right to marry was withheld until twenty. Another population growth control was crop failures which occured between 1451 and 1456.

With the Spanish occupation of the valley, the religious sacrifices were ended in the name of humanity. The result was a population explosion in the Aztec society, and the level of living among the Indians diminished to bare subsistence. The environment of the valley also changed. The Spanish began the process of filling in Lake Texcoco since the new city demanded a large land area for its broad plazas and wide avenues. The Aztecs had returned their wastes to the soil by way of reclamation as fertilizer; in Mexico City they were disposed of in latrines or in the street, poisoning the soil. As the Spanish buildings began to sink on the filled-in lake bottom, they ruptured their aging fresh water channels, and contaminants from the poisoned soil seeped in, laying the preconditions for the spread of urban pestilence.

This example shows us the population and the environment of the Valley of Mexico under two contrasting conditions of equilibrium. In the first case religious and social controls maintained the population at equilibrium through apparently inhumane sacrifice and ritual war and at a relatively ample subsistence level. In the second case, under a different

technology, organization, and world view, the rural population rose to the Malthusian limit of local productivity and reached equilibrium through the environmental mechanisms of starvation and infant death, while the urban population was controlled by pestilence.

The above example clearly shows the relationship between a population and the environment. Once the population begins to grow, the balance with nature is upset, and the environment begins to deteriorate. This is why our pollution problems today can never be solved until we first control our population growth. Wayne H. Davis in his article "Overpopulated America" says that many people are mislead into thinking we can save our planet by cleaning up the environment. He asserts that pollution is the symptom and population growth is the disease. Davis claims that banning DDT is the equivalent of the physician's treating syphilis by putting a bandaid over the first chancre to appear. However, unless the disease itself is treated you can be sure more serious and widespread trouble will soon appear.

In order to get a clear understanding of why there is a population problem today, it is necessary to trace the history of population growth. In the past, certain factors limited population growth. As countries developed many of these checks were removed and population began to increase.

THE GROWTH OF THE HUMAN POPULATION

"Early man, much like his anthropoid relatives, must have led a life largely devoted to hunting (or fishing) for his next meal and to avoiding his natural enemies. His food consisted of seeds, fruits, and roots gathered from nature. Although he probably captured and ate some of the smaller animals, early man generally was the hunted and not the hunter. With uncertain and seasonal food supplies, with little or no protection from the weather, and with the most primitive means of fighting his natural enemies, man's death rates must have been very high."[2]

"The discovery of the use of fire and the invention of weapons were great advances in man's economic evolution. He could now cook hard seeds and tough meat, making them more digestible and palable. Now that he had fire to warm his cave or hut, he could move into the colder areas of the temperate zone. Weapons enabled him to increase his food supply and to obtain skins for clothing and shelter. Fire and weapons provided some protection against the larger carnivorous animals. But man still lived a precarious life: food supplies were still uncertain; expanding population led to tribal warfare; and man had as yet no control over disease."[3]

"Sir Arthur Keith has estimated that the maximum population which such a hunting and food-gathering economy could support could not exceed 20 million people. This estimate may be too liberal. The total Indian population of North America probably did not exceed a million, people largely dependent upon hunting, fishing, and food gathering for their means of subsistence. With present agricultural techniques the United States and

Canada could provide ample food for a population of 200 million, and a subsistence diet for nearly a billion. In many parts of the world agriculture is more productive in terms of yields per acre but living standards are, in general, considerably lower. Keeping in mind the variation in agricultural production and living standards throughout the world, we can conclude that agriculture now supports from 200 to 400 times as many people as the hunting and food-gathering culture did. Thus, before the art of agriculture was developed some six or eight thousand years ago, the world population may not have exceeded 6 to 12 million people."[4]

"The development of agriculture was the greatest contribution to man's economic and cultural development. Only with a productive agriculture was it possible to release a considerable part of the working population from the time-consuming task of providing subsistence for itself. Industry, transportation, education, and the arts and sciences all become possible with the release of adequate manpower from agricultural tasks. In most of the world, however, the great increase in food production provided by agriculture has been used to support larger populations at subsistence levels."[5]

Several factors kept the human populations from growing rapidly even after the advent of agriculture. Tools and techniques for cultivation were quite limited. Most farming was done on the flood plains; clearing forest areas required more sophisticated tools and upland areas had poorer soil. Since many populations were still nomadic hunters, conflicts were inevitable, resulting in a high death rate.[6]

"With further population growth, little new land was available for agricultural expansion. The farms were divided into smaller units and were worked more intensively. Soon it was no longer possible to grow soiling crops to replenish the fertility of the soil. Organic matter, including human excrement, had to be brought to the fields to maintain crop production. Eventually the utmost labor provided a meager subsistence diet inadequate to sustain good health. Many died of diseases promoted by malnutrition. When there was inadequate rainfall or when the spring floods failed to restore soil fertility, many died of starvation."[7]

"The concentration of people in villages and cities was made possible by a more productive agriculture; but the concentration in turn fostered high death rates. Towns and cities of the Middle Ages were filthy by modern standards; the lack of santitation in the preparation of food and in the disposal of sewage undoubtedly made the town resident more subject to disease and pestilence than his rural cousins or the inhabitants of small villages. Pestilence was prevalent in ancient urban communities. Later, the notorious "Black Death" of the fourteenth century spread through Asia and Europe with devastating effects; it has been estimated that between a quarter and a half of the population of England was wiped out by this epidemic."[8]

Between 1600 and 1700 the population of the world began to grow more rapidly than ever. New continents were being opened up by explorers. These new lands provided additional sources of food, precious metals, and raw materials. They also provided an outlet for an increasing population. Improvements were made in crops and farming techniques. Agricultural output increased, and consequently, so did the margin over famine." It seems plausible that a combination of commercial and agricultural revolutions,

a period of relative peace, and the disappearance of the Black Death all combined to reduce the death rate and produce the European population surge which started in the mid-seventeenth century."[9]

"With the aid of science, a steadily increased deliverance from plague, pestilence, and famine had come about. By 1850 the expectancy of life in England had increased to about forty-one years. With more rapid progress in agriculture and industry during the second half of the nineteenth century, aided by some progress in medicine and sanitation, the expectancy of life in several countries had increased by 1900 to fifty years. Recent rapid advances have increased life expectancies to more than sixty-five years in the countries of Western Europe, North America, and Oceanica."[10]

About 1900, a demographic transition occurred, accompaning the Industrial Revolution. In the industrial countries the birth rate began to drop. What is the cause of the lowered birth rates? Children in industrial societies are not potential producers; they are consumers. They require extensive care, feeding, and education. Large families, which became more likely with lowered death rates, tended to reduce mobility and to make the accumulation of capital more difficult. Even in the rural areas there is only a finite amount of land which has to supply a livelihood for more people. Mechanization also reduces the need for farm labor. Therefore rural birth rates dropped as many people moved to the cities.

"The two principal demographic trends in the modern world have been a decline in the death rate in countries undergoing industrialization and a decline in the birth rate following industrialization. A third major demographic trend began around the time of World War II. A dramatic decline in death rates occurred in the underdeveloped countries. This decline was

caused primarily by the rapid export of drugs and public health measures from the developed countries to the underdeveloped countries. Victory over malaria, yellow fever, smallpox, cholera, and other infectious diseases has been responsible for decreases in death rates throughout most of the UDCs.* A critical point to remember is that this decline in death rate is different in kind from the long-term slow decline that occurred throughout most of the world following the agricultural revolution. It is also different in kind from the comparatively more rapid decline in death rates in the Western World over the past century. The difference is that it is a response to a spectacular environmental change in the UDCs, largely through control of infectious diseases, not a fundamental change in their institutions or general way of life. Furthermore, the change did not originate within these countries, but was brought about from the outside. The factors that led to a demographic transition (to low birth rates) in the DCs were not and are not present in the UDCs. Instead, a large proportion of the world's population has moved rapidly from a situation of high birth and death rates to one of high birth and low death rates. As a result, the annual rates of increase have risen sharply."[11]

Therefore by looking at the history of population growth we can see how population increased very slowly for thousands of years. Hunting man was faced with a limited food supply, a primitive defense system, and no control over disease. By the year 1 A.D., the population of the entire world had only reached 1/4 billion. But population growth began to pick up speed with the agricultural revolution and the discovery of new continents. In 1620, the world population had doubled to 1/2 billion. Death control came

* Note: UDC stands for underdeveloped country, and DC stands for developed country.

next and with the help of science, man learned to control diseases, diseases which previously had been a check on population growth. Only 200 years after the last doubling, in 1830, the population doubled again to 1 billion. Even though countries which were becoming more developed and industrialized began to have slightly lower birth rates, population growth was on the rise. In countries with no industrial base, birth rates are still very high but thanks to modern medicine, death rates are dropping drastically. The result is a booming world population growth rate. In 1930, the population of the world had doubled once more to 2 billion. And only 45 years from the 1930 doubling, it is estimated that the population will double again.

Man has skillfully removed the predators which limited population growth. Can human population growth continue to increase indefinitely? What is the carrying capacity of earth? What are some of the effects of population growth on the individual and on the environment?

PSYCHOLOGICAL EFFECTS OF POPULATION GROWTH

In order to analyze the effects of increased population growth on the human species, we must first look at how man has evolved. Modern man shares certain characteristics with his ancestors. Basically, man desires co-operation; he tries to share and combine resources. However, there exists a delicate balance between cooperation and competition. Dominate individuals began to emerge as leaders and groups were organized for strength and security. In the past man had the task of defending three things: (1) himself, (2) his family, and (3) his tribe. Man found he could accomplish this task easily when he was part of a group. Groups were held together by a strong leader. Within the group, cooperation was the dominate force; between groups, competition was the major force.[12]

Biologically, modern man is the same as the hunters and food gatherers of prehistoric days. Man's social organization has changed drastically, however. As the food supply increased, the human population began to grow. Towns began to develop and there was no longer the small, intimate group. In a super-tribe, a man no longer knew personally each member of his community.

With the growth of super-tribes, the forming of laws became necessary. In a small group, customs and costumes were the unifying force and provided the group with a form of uniqueness. In a large group, laws had to be made to provide some degree of unity. It has been said that laws were made to keep men from doing what their instincts encouraged; however actually, laws

forbid men to do only what the artifical conditions of civilization drove them to do.

Super-tribes drive men to - (1) disregard the value of human life, (2) compete to an extreme degree and (3) clash within groups. Increased population density leads to more impersonality which leads to more inhumanity towards other men. With more and more people, there begins to develop the attitude that there are people to waste and the value of one human life seems relatively unimportant. Consequently, there is a build up of competition and a drive for higher status. The accumulation of symbols is used to show the level of status. It is interesting to note that when the status race is the hottest, the suicide rate is the highest. It is believed that suicide is displaced aggression. Countries with a high murder rate have a corresponding low suicide rate. In times of war, there is a low suicide rate. With more competition and overcrowding, frustations grow and eventually erupt in inter-group conflict.[13]

At the present rate of urban growth and population increase, there will be a great amount of abnormal behavior, severe stress, violent aggression, and a break down of the social system within the city which is a super-tribe. The crowded city causes a loss of individual identity. Contact with large numbers of people is not normal for the individual. The result is an increase in abnormal behavior in proportion to the increases in the size and density of the city. As more and more people rush into cities, there becomes fewer jobs. Unemployment begins to rise and living conditions decline. The result is severe social stress for the individual. This all leads to a breakdown of the social structure of an ideally operating city and increasing amounts of mental illness, neurotic and psychotic disturbances.

Crime rates are some five times as high in urban as in rural areas. Incidences of divorce, suicide, child abuse, and various forms of mental breakdown are also higher in urban areas.

According to several biologists at the University of Wisconsin, mankind's genetic makeup is shaped by evolution to require "natural" surroundings for optimum mental health. The following were offered in support of this theory:

1. Man is best adapted to a topical savanna, but as a cultural animal we have adapted to cities.
2. In our homes we try to imitate climate and a natural setting: warm, humid air, green plants, animal companions, green houses, and a swimming pool. If possible we buy a house in the country or take our children to the seashore.
3. Man has positive physiological reactions to natural beauty and diversity and to the shapes and colors of nature (especially to green).

Basically, man needs a "natural" environment; man also requires a certain amount of living space. All city dwellers suffer from mild claustrophobia. City planners try to compensate for this by providing open spaces in cities and small bits of a "natural" environments, called parks. Individuals also seek relief from this claustrophobia by living in suburbia or taking trips to the country on the week-ends.

"In all countries of the Western civilization, the largest part of life is now spent in an environment conditioned and often entirely created by

technology. Thus one of the most significant and disturbing aspects of modern life is that man's contacts with the rest of creation are almost always distorted by artifical means, even though his senses and fundamental perceptions have remained the same since the Stone Age. Modern man is anxious, even during peace and in the midst of economic affluence, because the technological world that constitutes his immediate environment, by separating him from the natural world under which he evolved, fails to satisfy certain of his unchangeable needs. In many respects, modern man is like a wild animal spending its life in a zoo; like the animal, he is fed abundantly and protected from inclemencies but deprived of the natural stimuli essential for many functions of his body and his mind. Man is alienated not only from other men, not only from nature, but more importantly from the deepest layers of his fundamental self."[14]

"The aspect of the new pessimism most commonly expressed is probably the belief that decrease in individual freedom is likely to result from increasing densities of population and the consequent need to accept a completely technicized urban environment. A heavy and repetitious anthology could be composed of writings by all kinds of scholars lamenting the sacrifice of personality and freedom at the alter of technological regimentation. As society becomes even more highly organized, the individual will progressively vanish into the anonymous mass."[15]

Different people, however, have very different perceptions of what level of density constitutes a crowded situation. To a New Yorker and a rural farmer, the same town might be seen by the first as a desert of isolation and by the latter as a hubub of noise. When people are physically

unable to space out the population so as to provide suitable levels of density for most all individuals, other adjustments must be made. A good example is Japan. A century ago, Japan had 4 times the population density of the United States today. Consequently, the Japanese have developed a variety of cultural devices to alleviate the stress. Their formal and elaborate social etiquette provides self-protection against the inevitable frictions of constant human encounter. The Japanese also take a great interest in aesthetic values and have a high respect for nature, which is proven by their lovely gardens. The Japanese have used social arrangements constructively to help the people adjust to living on a crowded island.

There is no doubt that the population density does affect social arrangements. In areas of small populations, a large degree of personal freedom and easy manners may be allowed. As population increases more laws are needed. This results in more formality and a high degree of organization. Cities must have strong police forces, speed laws, traffic signals, stop signs, building codes, and zoning restrictions. As the size of cities increase, the laws will get more stringent. It might also be asked: How does overpopulation affect traditional ideals of cherishing human life? How do you react to a devastating flood, hurricanes, and airline crashes? Why is it that a citizen's cries for help are often ignored by bysiders in our large cities?

Several studies can be quoted to prove the detrimental effects of overpopulation. One study by R. Bob Smith III of the State University of New York at Albany tested the hypothesis that frustration often heightens the probability of aggressive behavior. This study is particularly relevant since the individual living in an urban center undoubtably experiences much

frustration. Dr. Smith used 47 students in his experiment. They were assigned tasks that could not be completed in the allowed three minutes. After two attempts, and the onset of frustration, they were given the ability to threaten a simulated target within the context of a game. As predicted, the frustrated subjects threatened and followed through with threats more often than did nonfrustrated subjects. The hypothesis was also confirmed in a effort to increase production at an automobile plant. Workers were asked to do more assembly line work in less time. "At the same time," says New York management consultant Roy W. Walters, "there were acts of sabotage and vandalism that grew out of worker frustration." This he says, signals the end of the assembly line as we know it. Its boring, dehumanizing aspects must be replaced by less aggressive work situations. He suggests a team-approach method in which semi-autonomous groups of workers assemble and install complete units themselves.[16]

In the famous rat community of Dr. John Calhoun, several rats were placed in a 10,000 sq. ft. pen. At the usual rate of reproduction after two years there should be 50,000 rats or at least 5,000 rats. However, after 28 months there were only 200 rats. Several reasons were given for the limiting of the rat population:

1. As population grew the head rats lost control of their groups.
2. Behavior changed - maladjustment, fighting, failure to eat properly, adults attack young
3. Birthrate dropped

Autopsies of experimental rats reveal exhaustion of the adrenal cortex, brought on by stress. Similar symptoms of stress pathology were found in

autopsies of many people who died in W.W.II concentration camps. The prevalence of stress-related diseases in cities suggests a relationship between adreno-cortical stress and deaths of urban dwellers.

Some animals simply drop dead during population explosions. The snowshoe hare, the mole and lemmings are examples. "Lemmings live on the arctic tundra and in the mountains of Scandinavia. They possess an awesome power of procreation, and start reproducing when only thirty-five days old. Each female gives birth to seven or eight young in a litter. She has four litters a summer and an unknown number in winter. As the lemming populations soar, so do those of the predators. But eventually the reproductive process of the lemmings gets the upper hand. About every four years their numbers become critical and the lemming population bomb goes off. Like a plague of locusts, a mass migration across the tundra begins, since both food and shelter have been eaten away. Panic sets in and many die from sheer anxiety or from injury that normally would not be fatal. Finally, their march ends in what has been described as a "mass suicide," often into the sea."[17]

Overcrowding causes physical problems such as housing and feeding an increasing population, and it also causes psychological problems. Man is finding it very difficult to live within a mass of people. In the future as more and more people converge on our urban centers, competition will increase and man will begin to feel the effects. Many will try to cope with the increases in birth defects, ulcers, and heart attack brought on from stress and frustration. Others will try to escape through the use of alcohol and drugs, or the ultimate escape - suicide.

OVERPOPULATED AMERICA

As Americans, we tend to think of the population problem as being somewhere else. We see lots of empty space in our country and we hear about our declining birth rate and we feel sure we could never be overpopulated. But our country is growing and our population will double in 70 years. In order to understand the problems we will be facing in the future, it is important to examine population trends in the past.

In the early 1800's, population growth in the United States was caused largely by immigrant Europeans. In the period from 1820 to the present, some 45 million persons came to this nation mainly from Europe. However, despite the heavy immigration, natural increase has always exceeded net immigration. In 1800, the birth rate has been estimated to have been so high as 55 births per 1,000 persons per year, a level about as high as ever reached by any nation. But in the early history of the country, death rates were also high, probably close to 30 per 1,000 persons per year. Hence, growth rate, without immigration, was about 2.5 per cent per year. This historical rate of population increase is not far different from that of contemporary India.[18]

During the nineteenth century, the birth rate as well as the death rate of the nation began to decline. The national birth rate tumbled from 55 in 1800 to a low of about 18 during the depression thirties. From the depression low in the 1930's, the birth rate rose in response to economic recovery in the late thirties and early forties. Both the marriage and birth rates soared so that the birth rate averaged about 25 per 1,000 persons per year

from 1947 to 1958. The birth rate has been declining since 1957 to reach an all time low of 17.4 in 1968.[19]

The decline in the birth rate of the United States since 1957 has led some to believe that the population explosion in the United States has run its course. Yet, the fact is that the United States is still faced with enormous population growth during at least the remainder of this century. It has been demonstrated by demographers that year-to-year changes in the crude birth rate or the fertility rate provide a rather inadequate basis for making projections for the future. The reason for this is that birth control now makes it possible for couples to postpone births under unfavorable conditions. Professor Norman Ryder, a demographer at the University of Wisconsin, has calculated that changes are taking place in the timing of births rather than changes in "quantity". He attributes the decline in the birth rate from 1957 to 1966, to a rise in the age of marriage and of age of mother at births, not to women having permanently small families.[20]

The reason for the increased age at marriage and at childbirth since 1957 can be traced to the consequences of the postwar baby boom. The tidal wave of babies between 1946 and 1958 has produced a huge bulge in the number of persons now reaching labor force and reproductive age. It is mainly by reason of their relatively great numbers that youth unemployment rates have skyrocketed. Inability to obtain employment together with the impact of the Vietnam War have operated to reverse the downward movement in age at marriage and at births, and these changes have been a major factor in the depressed birth rates since 1957. Since such changes do not necessarily affect average size of completed family, it is a grave mistake to use the declining "period"

crude birth rate or fertility rate as a basis for future population projections.

Our future population growth will depend on the decisions of the young women now entering their child bearing years. They, themselves, are the result of the postwar baby boom, and their vast, unprecedented numbers mark a new high in the U. S. fertility potential.

Between 1960 and 1970 there was a 40 percent increase (from 11.1 million to 15.4 million) in the number of women in the prime child bearing ages, 20-29. By 1980, the 20-29 year-olds will nearly double to a count of 20 million. As the increased number of prime fertile women (aged 20-29) start having babies, will they choose the higher fertility of the 1950's or follow through with the lower fertility rates of the early 1960's.[22]

With such an enoromous increase of potential brides and mothers, the number of children desired by these women becomes of crucial importance. If they choose the "two-to-four-child" family, the fashion set in the 1950's, then the nation is in for a baby boom of unprecedented magnitude. Such a high-fertility rate ... could result in a total U. S. population of nearly 400 million by 2005... If, on the other hand, the brides-to-be follow a trend toward fewer babies, the potential of the baby harvest would be diminished and could produce a minor baby boom. If these young women opt for the "one-to-three child" family, then the shockwaves hitting the schools and other vital areas will be less devastating. And the prospect of 300 rather than 400 million Americans in 2005 will be the more likely one.[23]

Clearly Americans don't have to worry about running out of space for some time. But even though we are not a densely populated country, there is reason to believe that already we have too many Americans. People in the

United States have achieved the highest standard of living in the world but in the process we may have lost some of the good things in life. Americans are demanding quantity but overlooking quality. And in satisfying our unlimited wants, we are using up our natural resources and abusing our environment.

Dr. Jean Mayer, of the Center for Population Studies at Harvard University, has said, "Rich people occupy much more space, consume more of each natural resource, disturb the ecology more, and create more land, air, water, chemical, thermal, and radioactive pollution than poor people."[24]

It has been estimated that the average American uses more resources and produces more pollution than fifty people in India. The people in the rich industrial nations are traveling first class on Spaceship Earth. And in order to maintain that first-class status, resources are gathered from all over the world. This suggests that the United States may be overpopulated not because people are packed together, but because the earth can't support too many rich people. They also show how dependent this nation is on the rest of the world. What if poorer nations were no longer willing or able to supply our needs? Dr. Paul Ehrlich has said, "Calling the world population explosion a problem of undeveloped nations is like saying to a fellow passenger, 'Your end of the boat is sinking.' "[25]

If our population continues to increase with each American demanding his share of the pie, what might we expect in the future? Increasing population growth and wasteful consumption will more than likely result in many frictions within the United States. Physical, economic, personal, social, racial, and governmental problems will worsen. Examples of the physical

problems include air, water, general environmental pollution; traffic congestion; slums, and problems of public housing and urban renewal. The personal and social problems include rises in delinquency and crime rates, the revolt of youth, minority rebellions, and deteriorated standards of education. The economic problems include youth unemployment and great fluctuations in demand for housing and goods with rapidly changing age structure and family formation. The problems of government include struggle for political control between rural and urban leaders, chaotic conditions in local government brought on by increased numbers of people, and the growing power of the federal government which must provide order as urban centers grow and expand. If we are to ever find solutions and ways of dealing with these problems now and as they become more complex in the future, we must realize the real cause is population growth and our first step must be to control it.[26]

MYTHS CONCERNING POPULATION GROWTH AND CONTROL

It should be obvious that population growth cannot continue to steadily increase. For most of his history, man's birth rate has equaled his death rate or has been just slightly above it. Now his death rate is well below the birth rate and the human population is rising rapidly. From their studies of the ups and downs of animal numbers, scientists have determinded two facts that apply to the human population:

- Man's environment, the earth, is limited in resources and size, so the human population must level off sometime.
- If humans do not limit their numbers themselves, some factor in their environment (such as disease, or lack of food or space) will do it.[27]

Unfortunately too many people refuse to consider the problem of population control seriously. They rationalize that somehow the problem will take care of itself, which of course it will, but not the way they are hoping. Many popular myths exist about the population crisis. People often use these myths as an excuse for inaction. It is important that these myths are dispelled in order to deal with the reality of the situation we are now facing.

Myths:

1. Space Migration

"Migration to other planets, as an alternative to birth control, has recently been suggested by the Director of the Family Life Bureau of the National Catholic Welfare Conference. The feasibility of such migration has been considered by Garrett Hardin, who points out (in Journal of Heredity, March-April 1959) that the nearest star is Alpha Centauri, 4.3 light years

away. Even at an average speed of 7 million miles per hour, a rocket ship would take 350 years to reach the nearest planet outside our own solar system."[28]

"Assuming that the world could support a population of 10 billion and that population growth continues at the present rate, in 70 years it would be necessary to move 170 million people each year. Assuming 100 passengers per spaceship, the migration would require 1.7 million spaceships each year - at a cost, Hardin estimates, of $300 million per ship. But if birth control is not to be practiced on earth, it would surely not be practiced on the spaceships. If only one couple started the trip, the number of progeny (even allowing for the deleterious effects of inbreeding) would be about 2000 at the end of the trip. Thus it would be necessary to provide 85 million spaceships every year, each with a capacity of 2000 and at a cost of several billion dollars per ship."[29]

"But even such mass migration would afford only temporary relief, for if the migrants to other planets continued to increase at present rates, the mass of humanity would exceed the width of the entire universe in about 6000 years, and the area they occupy would be expanding with the speed of light."[30]

A British physicist, J. H. Fremlin, has made some interesting calculations on how much time we could buy by occupying the planets of the solar system. For instance, at any given time it would take only about 50 years to populate Venus, Mercury, Mars, the Moon, and the moons of Jupiter and Saturn to the same population density as Earth.[31]

What if the fantastic problems of reaching and colonizing the other planets of the solar system, such as Jupiter and Uranus, can be solved?

It would take only about 200 years to fill them "Earth-full". So we could perhaps gain 250 years of time for population growth in the solar system after we had reached an absolute limit on Earth.[32]

Interstellar transport for surplus people presents another amusing prospect. Since the ships would take generations to reach most stars, the only people who could be transported would be those willing to exercise strict birth control. Population explosions on space ships would be disastrous Thus we would have to export our responsible people, leaving the irresponsible at home on Earth to breed.[33]

2. Immigration on Earth

Immigration on Earth has also been suggested as one solution to overcrowding on Earth. Why not simply move people to underpopulated countries - like Australia or Canada? One reason is that people do not like to uproot themselves. Many unemployed coal miners in Appalachia prefer to remain in poverty rather than leave their home. Too, serious problems would arise when it comes to moving millions of people from China or India into other countries. Would we permit them to enter the United States?[34]

Also people can not be moved just to an empty space. Not many people could live in such places as the mid-Atlantic, the Sahara Desert, or the moon simply because there aren't enough fresh water and other resources to support life. Empty space does not necessarily mean room for population expansion.[35]

3. Industrialization

Many people look to industrialization to save us from the population explosion. However, this may not be a realistic hope. Increasing industrialization has had several important effects on population, some good and some not so good. It has offered massive employment, which tended to improve

living conditions. Despite the negative effects of sweatshop work, dangerous mining and manufacturing practices, and exploitation of labor, early industrial populations increased. Medical advances obviously assisted; labor unions reminded industries of the need for healthy workers; and money to forestall accidents became more readily available. In the past, industrialization has not decreased the population growth rate. World population increased on an average of about 0.3 percent per year from 1650 to 1750, 0.5 percent per year between 1750 and 1850, 0.8 percent per year from 1850 to 1950, and now averages a 2.0 percent gain per year.[36]

The Industrial Revolution has contributed to population growth by decreasing death rates, not by increasing birth rates. In fact, European birth rates declined as industrialization progressed, but lowering death rates kept the population expanding.[37]

Industrialization has also brought with it the plague of pollution. Modern industrialized countries must face the problems of air, water, and soil pollution plus the problems of solid waste disposal and noise pollution. Industrialization also requires vast amounts of raw materials and natural resources - these are limited and cannot continue to be consumed. Wayne H. Davis in his article Overpopulated America, says that trying to clean up the environment is a mistake; pollution is only a symtom, the real cause of our problem is our rapid growth rate and our high consumption.

4. Raising the Standard of Living - Example: The United States

For those optimistic souls that believe industrialization and a rising standard of living will save our planet from the population problem, the situation in the United States should be considered. Many are the problems that

accompany an affluent society and it must be remembered that a lowering of the birth rate does not guarantee a decrease in the growth rate. True - our birth rate has been decreasing, however our death rate has also decreased and immigration to the United States has risen. Therefore a rising standard of living has not brought a decrease in the growth rate, but it has produced a country of people who consume large amounts of natural resources, pollute the environment, and quickly throw away that which has been used.

The tragedy facing the United States is even greater and more imminent than that descending upon the hungry nations. The Paddock brothers in their book, Famine 1975!, say that India cannot be saved no matter how much food we ship her. But India will be here after the United States is gone. Many millions will die in the most colossal famines India has ever known, but the land will survive and she will come back as she always has before. The United States on the other hand, will be a desolate tangle of concrete and ticky-tacky, of strip-minded moonscape and silt-choked reservoirs. The land and water will be so contaminated with pesticides, herbicides, mercury fungicides, lead, boron, nickel, arsenic and hundreds of other toxic substances, which have been approaching critical levels of concentration in our environment as a result of our numbers and affluence, that they may be unable to sustain human life.[38]

5. The "Green Revolution"

Many people believe the theory which states that population growth will outrun the food supply is unfounded, and that better agricultural methods will be able to handle any forseeable problem. In Asia, the seeds of hope,

the Green Revolution, may become the seeds of destruction. The Philippine rice harvest is down 3 percent from last year, and for the second year in a row the country will import massive amounts of foreign rice to satisfy domestic demand. The Philippine population is increasing at the rate of 3 percent a year, so a 3 percent drop in the production of the country's staple food is a serious matter. Articles in the news media have emphasized the technological break-through, the "miracle seeds" that will quadruple grain production. However, for the peasants and small farmers the "miracle seeds" are threatening to run them out of business. These new seeds must be used in conjunction with optimum levels of irrigation water, chemical fertilizers, and pesticides.[70] to 90 percent of Asian farm families have no irrigation water and no cash or credit for the purchase of chemical products. But as competition by big, efficient managers strengthens, the small producers will be forced into credit-based agribusiness. If the new varieties should fail even for a single year, the small farmer may have to sell his land.

Therefore the higher productivity of the miracle seeds will not bring even a temporary rest from the problems of hunger and malnutrition in Asia. Hunger and malnutrition are the result of social inequities and population growth. The Green Revolution is intensifying the social inequities. And by dislocating millions of families and increasing the economic uncertainties of their lives, the Green Revolution plants the seeds of unrestrained population growth and chaos.[39]

Dr. George Wald in a article, "A Better World For Fewer Children", raised an interesting point. He states that our world can expect many famines by the end of the century but that an argument against population growth should

not be based on the theory of a limited food supply. This sort of reasoning implies that if we can find a way of feeding a large mass of people, then population growth is fine. Dr. Wald says our major concern should be not how many people we can feed but rather what population size is best in order to have a high quality of human life. By this standard, the world is probably now overpopulated. Dr. Wald claims that China and India were once great cultures, enormously creative in the sciences, the visual arts, and literature. He believes that those aspects of Indian and Chinese culture declined centuries ago for reasons associated with overpopulation. "The point then is not how many people one can feed on this planet, but what population can best fulfill human potentialities."[40]

POPULATION EDUCATION

"Population education is defined as the process by which the student investigates and explores the nature and meaning of population processes, population characteristics, the causes of population change, and the consequences of these processes, characteristics, and changes for himself, his family, his society, and the world. It is a process whereby the student learns that individual acts, such as having children or moving from one place to another, have demographic consequences. He learns that the consequences of these individual acts have implications, both social and biological for his family, for the society in which he lives, and for the world as a whole, implications which in turn affect him as an individual.

The goal of population education is to assist students to conceptualize the relevance of population for themselves, to assist them thereby to make rational and responsible individual and collective decisions about population matters utilizing appropriate information and analytic skills. The key concept is responsible decision making which involves foreknowledge and understanding of the consequences of one's actions.

Population education is meant to educate, not to propagandize or indoctrinate. Population education views population not as a "problem" to be solved, but as a "phenomenon" to be understood. This understanding is the intellectual underpinning for responsible action. But population education also encourages the student to view himself within the context of the broad range of familial and societal relationships which his actions and his life style affect and are affected by both now and in the future. Thus population

education programs must also involve students in an exploration of their own values and attitudes.[41]

According to an article by Byron G. Massialas in the April issue of Social Education there are three main ways population education can be introduced into the formal school curriculum. They are (1) the "Program Infusion" approach, (2) the "Unit of Study" approach, and (3) the "Separate Course" approach.

The first approach seeks to supplement and strengthen the existing curriculum with regard to its treatment of population matters. This approach adds population information to the material already being taught and emphasizes the importance of population education. In this technique a population episode, a brief unit of study which focuses on an important population topic, is added on to a traditional topic being studied in a given subject. Normally, an episode should not exceed 25 pages of printed material and should not consume more than a week of classroom time (one class period per day).[42]

The second approach gets at population education through changes in the organization and sequence of the curriculum. A unit on population is taught under a general curriculum area, such as social studies, yet it is not directly connnected to any other topic that has been studied. A unit differs from a episode in that it covers a fairly broad issue, it assumes no prior knowledge, and it includes a period of no less than five or six weeks. A unit of study would fit very well in schools which now have mini-courses and would stress curriculum relevance through theme-related instruction.[43]

The separate course approach would add population education as another general course such as geography, history, or sociology. This course would

have to be inserted into one of the already existing disciplines. A multi-disciplinary course on this theme drawing from social science, biology the humanities, and the natural sciences would be almost impossible due to the historical development of the curriculum. The one difficulty with a separate course of study is that the present curriculum is quite crowded and to press for a new offering would mean the displacement of another.[44]

"Some observations about the three curriculum approaches sketched above might be useful here. It is probable that no one approach is the best since local educational conditions would vary. For a school district which bases its programs on theme-related mini-courses, the introduction of 6-week units of study might be the best alternative. Districts which have no plans for drastic curriculum change may view the introduction of population episodes in the context of the traditional organization to be the best approach. Finally, some schools or colleges in the United States or abroad which either have room in their curriculum for expansion or are open to course experimentation may want to insert a semester or year long course on population. It is possible that a series of episodes or units organized on some logical or sociopsychological principle could be drawn together to form such a course. If this were the case, then the task of the classroom teacher and curriculum planner in developing the material and placing it in classroom might take a different form."[45]

POPULATION PROGRAMS

Population information can be organized by the teacher in a variety of ways. Lessons in population education can be fit very well into the social studies or science disciplines. The following are lesson plan outlines, ideas, and information which a teacher can use to introduce population education in his or her class.

Presentation Guidelines

1. "The History of Population Growth"
2. "Psychological Effects of Overcrowding"
3. "The Planet Management Game"
4. "The Population Game"
5. "For All to Enjoy" (film)

Plays

1. "Which Way America"
2. "Taking Honor"

Population Survey

PRESENTATION GUIDELINE

Title: The History of Population Growth

Length of Presentation: 1 hour

Grade Level: Social Studies and Science 5 - 12, Adults

Summary: This program is designed to trace population growth from 10,000 B.C. to the present time. Through the use of transparencies and discussion, the class will examine the factors which determine the size of the population. The program will help the children to reach a better understanding of why we have a population problem and how it is getting greater.

Overall Objectives: The students will develop an awareness of why the population of the earth, which has been slowly increasing, is now doubling in fewer and fewer years. They will learn what factors determine the rate of increase - the birth rate, the death rate, economic conditions, epidemics, and wars.

Concepts:

1. The growth rate equals the birth rate minus the death rate.
2. The population can be increasing although the birth rate is dropping.
3. Population growth can be controlled by decreasing the birth rate or increasing the death rate.

Behavioral Objectives:

1. Fifty percent of the class will be able to state the difference between the growth rate and the birth rate in a brief paragraph.
2. Fifty percent of the class will correctly answer the following:
   a. If a large number of women are of child-bearing age, the population will increase. TRUE FALSE
   b. If the birth rate stays the same and the death rate dropped, then the population will stay the same. TRUE FALSE
   c. When families move to the city, it is more to the advantage of the family to have fewer children. TRUE FALSE

Activities: Discussion based on the following transparencies -

1. Problems of Overpopulation
2. Under-Nourished and Mal-Nourished
3. Determiners of Population Density
4. Terms
5. History of Population Growth
6. U. S. Birth Rate and Population Growth
7. World Population
8. Fewer Babies Die Today
9. Overpopulation - World Population
10. Doubling Time
11. Prey - Predator Relationship
12. Summary

Follow-Up Activities:

1. Research different areas of pollution caused by over-population.
2. A discussion on the psychological effects of overcrowding could be conducted, using study prints.
3. A play based on what the world will be like if population goes unchecked could be given.
4. The class could play Planet Management or The Population Game.

Resources and Materials Utilized:

Material to make transparencies
Overhead Projector - Extension Cord - Screen

Bibliography:

Environment and Pollution. Louis D. and Sara Mason. A transparency program for self-instruction.

Teachers' Reference on Population Problems. O. J. Sikes III.

THE HISTORY OF POPULATION GROWTH

I. In a brief paragraph state the difference between the growth rate and the birth rate.

II. Circle the correst answer

1. If a large number of women are of child-bearing age, the population will increase. TRUE FALSE
2. If the birth rate stays the same and the death rate dropped then the population will stay the same. TRUE FALSE
3. When families move to the city, it is more to the advantage of the family to have fewer children. TRUE FALSE

PRESENTATION GUIDELINE

Title: Psychological Effects of Overcrowding

Date: December 1971 Length of Presentation: 1 Hour

Grade Level: Middle Grades

Associated Curriculum Areas: Social Studies and Science

Summary: This program will begin with the use of a study print (NEED) on population density. The class will be presented with discussion questions. Studies and facts will be given to the group if needed. The discussion will center around man's psychological relationship to nature and how it should be a factor in determining optimum population size.

Overall Objectives: Students will realize that man has a psychological need for a "natural" environment.

Concepts:

1. Different people have very different perceptions of what level of density constitutes a crowded situation.

2. Man has certain reactions to natural beauty and diversity, to the shapes and colors of nature.

Behavioral Objectives:

1. Fifty percent of the students will be able to state why downtown Asheville would seem too crowded to an Eskimo who lived in the vast lands of the Artic but not to a person from New York City.

2. The learner will be able to write a brief paragraph describing some mental problems caused from living in a too crowded world.

Activities:

Use of a study print and discussion

Follow-Up Activities:

1. Allow the students to set up their own rat studies much like that of John Calhoun.

2. Divide up into parts the Scenerio from the Population Bomb (Chapter 2) and give them to several students and let them present the scenes to the class.

3. Show a film on the psychological effects of overcrowding.

Bibliography:

American Scientist. 57.
Science. 168.
Scientific American. February 1962 and January 1971.
New York Times Magazine. April 28, 1968.
Population, Resources, Environment. Paul and Anne Erlich.

PRESENTATION GUIDELINE

TITLE: The Planet Management Game

DATE: November 1971 Length of Presentation: 3 Hours

GRADE: 6th - Adults

SUMMARY: This game would work best with a small group of 5-10 students, but it can be used with a class of about 25-30 students. The game is most effective if an entire morning or afternoon could be devoted to it. The Planet Management Game helps students to understand contemporary problems like pollution, famines, and the population explosion. It causes students to imagine that they themselves are creating global problems and trying to solve them.

OVERALL OBJECTIVES: By playing the game, students learn that people's lives are affected by many complex factors, including population growth, food supply, income levels, and the quality of their environment.

CONCEPTS:

1. Overpopulation inevitably brings on pollution.
2. Food is a limiting factor in population size.

BEHAVIORAL OBJECTIVES:

1. The players will begin to choose projects which limit population growth, if the population size grows more rapidly than the other indexes.
2. The players will list a food supply which is above population size, as a criteria for winning.

FOLLOW-UP ACTIVITIES:

This game could be used to introduce, or in conjunction with, a unit study of population growth or a program which deals with pollution.

PRESENTATION GUIDELINE

Title: The Population Game

Date: November 1971 Length of Presentation: 2-3 Hours

Grade: 6th Grade - Adults

Summary: This game is played by 2-6 players, each representing a country. Each player begins the game with a limited amount of money, a small population, and agriculture adequate enough to feed his population. His goal is to build his country into an advanced, industrialized nation whose population and resources are in balance.

Overall Objectives: The players will learn that poor planning will allow their population to explode. There is no remedy for the final population explosion.

Concepts:

1. Population Growth Rate is how slowly or rapidly a country's population increases or decreases.
2. Medical and educational advances are important factors in population growth.

Behavioral Objectives:

1. The player winning the game will have achieved a Population Growth Rate of 0.
2. After completing the game, each player will be able to correctly respond to the following:
   a. Medical advances tend to increase a country's Population Growth Rate. TRUE FALSE
   b. Educational advances tend to reduce the Population Growth Rate in a country. TRUE FALSE

Follow-Up Activities:

This game could be used to introduce or in conjunction with, a unit study of population growth.

PRESENTATION GUIDELINE

Title: For All To Enjoy (film)

Date: January 1972

Grade Level: Any Grade Length of Presentation: 1 Hour

Associated Areas: Social Studies and Ecology

Summary: The class will begin with the first half of the film. The film will be stopped and a discussion will follow, based on a NEED study print (Crowded Campsite). The session will close with the second half of the film. This program can be used when studying population or the preservation of natural areas.

Overall Objectives: To help the students realize that even our few remaining wilderness areas are not removed from the problems of overcrowding.

Concepts:

1. Crowding makes it difficult to experience the out-of-doors fully - if there are large numbers of people, the special quality of a place is lost.
2. As the population increases, it becomes more urgent that we preserve natural areas and make wise plans concerning their development and use.

Behavioral Objectives:

1. Fifty percent of the class will be able to briefly write a valid reason why cars should be banned from national parks.
2. Given a choice of three uses for a wilderness area, the student will pick the one which helps preserve the land in its original state.

Follow-Up Activities:

1. Take the class on a hike for the purpose of enjoying the outdoors.
2. Have a discussion on the psychological effects of overcrowding using the NEED study print on population density.

Resources and Materials Utilized:

1. Film projector and screen and extension cord
2. NEED study print

Bibliography:

For All To Enjoy (film). National Park Service.
Environmental Education Picture Packet. NEED. (Study Print and Teacher's Manual)

WHICH WAY AMERICA?

Introduction

This play was written to be used with a study of overpopulation. The students should be guided to an understanding of how many of the environmental problems found in the play are caused basically by too many people. In the area of social studies, this play could also be used to show how the political situation is affected by a growing population. The students might compare personal freedom and population growth. The play can also be used in science, to start a study of food chains, the effects of pesticides, or the "greenhouse" effect. The class might choose to write an ending for the play, which would be a language arts activity.

After the play has been read, the class could be divided into small groups. In order to help the students really examine what's happening in the play, each group could fill in a chart listing (1) the environmental problems described in the play, (2) what probably caused the problems, and (3) a solution to each problem. Some groups might want to see what could have been done 10 or 15 years earlier to prevent the problems from becoming so serious. Another group could try to work out solutions to the problems at the time the play is taking place. Still other groups might try to imagine what would happen if nothing was done to solve the problems.

This play is especially useful in introducing a unit in environmental education. Hopefully it will give the students a broad view of many of the problems we are now facing.

WHICH WAY AMERICA?

by

Mary Beth Durner

Cast of Characters

The President
Dr. Moss, Presidental Advisor
Mr. George Gills, Advisor and Member
of the Environmental Protection Agency
Mrs. Jane Gills, wife of George Gills
Mr. Lester Jones, Agricultural Advisor
Eve Andrews, a neighbor

Time: 1976

Place: Washington, D. C.

Background:

It seems almost certain that conflicts among nations in the world will increase in the future. The countries without industry and many natural resources will be facing more and more problems, while the more industrialized and developed countries become richer. The chances of war grows greater as the gap between the poor and rich nations widens. One factor which is constantly putting pressure on the poorer countries is its growing population. As the population grows, the amount of resources and food steadily decreases. This situation forces the people to fight among themselves in order to get enough to survive.

The population problem in the rich nations is just as serious - not so much because of limited natural resources or too little food - but because the people in the more developed nations waste more and pollute more. It must be remembered that population can be controlled in only two ways - lower the birth rate or increase the death rate. With all the tension between the many countries of the world, war might be the one thing which will cause the death rate to increase. This could decrease the world population but it might also completely destroy our environment.

In the United States, the President is trying to make a very important decision. Should he allow the farmers to use a new, more powerful chemical to try to save the wheat crop? If he doesn't let them use it, he may lose the next election. But if the chemical is used, how will it effect the environment and how will it's use effect other countries, such as Japan?

To the average housewife, the environmental crisis is also very serious. Many people are out of work, food prices are high, and clean, unpolluted food is getting harder and harder to find.

Setting:

A meeting of the President and his advisors for the purpose of discussing several new ideas and their effect on the environment.

President *(pacing about in front of the window)*: Let's get to the point, Dr. Moss. Will we or won't we be able to get a good wheat crop this year?

Dr. Moss *(standing in front of the blackboard - he throws his chalk into the tray below the board)*: You know I can't promise you what will happen in the future. Last year was a bad year for growing crops and this year could be worse. My guess is that the wheat will be like the corn crop - it will steadily get smaller until finally the farmers will refuse to plant any more.

President *(turning to Mr. Gills)*: What do you have to say, Professor Gills?

Mr. Gills *(seated looking over papers on a table)*: I can't be sure what will happen in the future, either. All the reports I've gotten show we are in a mess. The fishing industries are being forced to close down because of too little clean fish. Our polluted oceans are probably caused by all the DDT we have been using. And the DDT doesn't even kill the wheat bug anymore. We could use a stronger insecticide, but it would be more dangerous.

President *(turning to Lester Jones)*: Les, what do you say?

Lester Jones *(sitting slumped in a chair in the corner)*: I feel like quitting. The farmers care only about saving the wheat crop. Why should they care about the fishermen? If you want their votes, you sure better let them try that new chemical.

President *(looking worried)*: What will happen if we do use his new insecticide?

Lester Jones Well, a lot of people will probably die - that chemical is powerful stuff. The wheat crop will more than likely fail because of the weather change, but if you don't let the farmers have their insecticide they'll blame us.

Mr. Gills *(rising from his chair and facing the president)*: Mr. President, I'll have to quit if you decide to use that new chemical, my friends would hang me! Half of the Environmental Protection Agency will be quitting. Your Vice President will be pretty mad too.

President *(looking out the window and thinking out loud)*: You're right, the Vice President will really be upset. He's our leader in the United Nations and he's been trying to get a law passed that would forbid the use of chemical insecticides. Already the law has been passed by all the major nations.

The use of insecticides can affect the environment of the entire world. Many countries in the world depend on the oceans to feed their people. Japan might even declare war with any nation that would add more pollution to the oceans. Japan now has nuclear weapons. The United States could be in real trouble if she breaks this law.

ACT II

Setting:

A small kitchen at mid-afternoon. Jane Gills is sitting at a table having a cup of hot coffee with a neighbor, Eve Andrews.

Jane Gills: I'm very sorry your husband is out of work, but with half the population unemployed it's hard for anyone to be sure about his job.

Eve Andrews: Yes, I know. I'm not sure what we're going to do now.

Jane *(a little surprised)*: I thought you had somehow managed to save a little money, can't you live on that awhile?

Eve: I'm afraid what little we saved won't go very far anymore. Prices are already so high we can't afford many foods.

Jane: I always worry about enough food to feed my family. George makes a good living but everything costs so much these days. Can you remember ever eating steak? Now who can afford steak at $12.00 a pound?

Eve: I don't understand why beef prices went so high after the failure of the corn crop - but they sure did.

Jane *(flashing a sudden smile)*: Boy will George be happy. I was really lucky today. I went to the grocery store early this morning and I was able to get some special, fairly unpolluted fish for dinner. It's hard to find seafood that's safe to eat.

Eve *(rising from her chair)*: Well, I'd better get back home. Tomorrow Fred and I are both going to look some more for a job. If we can't pay our bills, they'll take our apartment. Then I don't know what we would do. People are already so packed together, I don't know where we could live.

(Eve gives a little wave and leaves the room. Jane puts the fish back into the refrigerator and goes into the living room and begins to straighten things up. George comes in through the front door, hangs his coat in the closet and drops down in a big chair.)

Jane Gills *(sitting in a chair facing him)*: How did your meeting with the president go today?

George Gills *(looking rather sad)*: You might as well know - it will be in the morning papers. For one thing, the President has decided to start a program which would limit the amount of food each family receives. It's going to be very strict.

Jane: I thought that's what you wanted. You've said for a long time that even having a good population control program couldn't produce results fast enough. Two years ago every family was limited to no more than two children but it will still take about seventy years before the population stops growing. Every year we have more and more people and we just can't produce food fast enough.

George: No, we can't. Even with food being equally divided, a lot of Americans are going to starve to death. That climate change really hurt our food corps. We started getting our first signs of real trouble in the early 1970's, but nobody believed it would happen. Almost a billion human beings starved to death in the last six years. But until the last few years, Americans kept thinking only the poorer countries had to worry about starvation and overpopulation.

Jane: Well, I know things will work out.

George: I am not so sure. The President also gave permission to the farmers to use a new, stronger chemical insecticide. He says he needs the farmer's votes. I've quit my job. It's back to California for us.

Jane: Oh, no! Washington is bad enough. Other than all the fighting which occurred when the Family Size Regulation Act was passed, everything has been fairly nice here. The smog in California is terrible. I always hated to have to carry a purse full of quarters for the "Breath-A-Life" machines. Of course soon they will have to have the machines everywhere, especially in the cities where the air is so polluted and it's so crowded. And I hate to think of what all the noise is doing to our ears.

George Gills: I just don't know what we can expect in the future?

WHICH WAY AMERICA

	PROBLEM	CAUSE	SOLUTION
1.	Failure of wheat and corn crops	Bugs - Weather change	Limited use of insecticides - Organic farming
2.	Decline of oceanic fisheries	Massive doses of DDT Pollution of oceans	Ban on DDT Elimination of dumping of wastes in ocean
3.	Highly resistant wheat and corn bugs	Extensive use of DDT	Organic farming
4.	President who is more vote conscious than concerned about the environment	Farmers v.s. Environmental Protection Agency	Public officials whose first concern is the environment
5.	Weather change	Green house effect Rise in the heat level Layer of pollution blocking in sun's rays	Elimination of air pollution Cut down in electricity production because power plants are major air polluters
6.	Half of population unemployed	Growing population	Limited population growth
7.	High food prices - especially meat	Failure of corn corp no food for beef	Smaller population - Organic farming
8.	Polluted seafoods	Industrial pollution of oceans and use of DDT which washes in the ocean	Eliminate dumping of wastes in ocean - ban the use of chemical insecticides
9.	Crowded living conditions	Too many people	Limited population size

PROBLEM	CAUSE	SOLUTION
10. Food rationing	Growing population	Limited population size
11. Stricter laws	Large, starving population	Population checks
12. Family Size Regulation Act	Unchecked population growth	Voluntary family size regulation
13. Smog (Breath-A-Life Machines)	Air pollution	Strict laws on air pollution - Smaller population Clean industries
14. Noise pollution	Crowded cities	Strict noise pollution laws - Better planned cities - Limited population size
15. Growing international tension	International ban on DDT - Poorer countries starving	Organic farming Limited population growth Officals who are concerned about the environment

TAKING HONOR

by Jill Infiorati

Cast of Characters

Dr. Walker, *a father*
Laura, *his wife*
Karen, *his daughter*
Johnny, *his son*
Vince,Sullivan
Inspector Stone
Mr. Braddon
First Guard
Second Guard
Three Newsmen
Other Guards
A Photographer

TIME: *Soon*

PLACE: *A town in Rhode Island*

SETTING:

A large living room at twilight. It looks somewhat the worse for wear; at right is the front door, which is barricaded with a desk and an easy chair. To the left of the door is a picture window, boarded up. The kitchen door is at rear, bedroom hallway is at left; both are dark. The living room is lit by a large candelabra, and Laura can be seen dimly lying on a nearby couch and covered with blankets. She seems sick and pale. Karen is sitting at the front of the stage, softly playing a guitar; she is about 18, wearing sweater and slacks. Johnny, about 20, and Dr. Walker, both warmly dressed, are looking through the boards on the barricaded window. A phone is on a small table at stage front, off the hook.

John *(in a hard voice)*: Twilight. Probably all gone home to dinner. Or down to Jiggie's for a beer.

Doctor: Well-*(takes a last look out the window, then turns aimlessly back to the room)* I guess we won't be bothered again tonight. *(to Karen)* You want to start dinner, Princess?

Karen: It's cooking now. *(Rises and lays guitar aside)* I was just going to check on it, though. *(As she passes the couch she pauses to whisper to Laura.)*

(Johnny watches Karen, hands stuffed in his pockets. He seems annoyed but says nothing to her. After a minute he lifts a gun from behind the desk and begins cleaning it with a rag that is lying on the floor.)

Doctor: Oh, John. (*sighing*) Put that away, we don't need it.

John (*not bothering to look at him*): We'll need it. It's the third day, and they haven't got much time left, so - (*takes slow aim at some point in the audience*) We'll need it. (*Doctor Walker gives him an awkward look.*)

Doctor: Well, I'm not going to argue tonight. If you feel better with that thing in your hands, go ahead and clean it. Go ahead and hold it all night if it makes you feel better. But I'm tired of arguing and I'm not arguing any more. (*He goes into the kitchen. As Johnny continues cleaning the gun, sounds of pleasant conversation and a meal being prepared come from the kitchen. Johnny ignores them.*)

Karen (*from the kitchen*): Johnny, how 'bout coffee? I've got some all made.

John: No, not now.

Laura (*weakly, from the couch*): I'd like a cup, please dear. (*Her voice startles everyone. Dr. Walker comes from the kitchen. Johnny hesitates over the rifle, then quickly begins cleaning it again. He appears to be listening, however.*)

Doctor (*sitting beside her on the couch*): Laura? How do you feel?

Laura: Oh - we're fine. Are they - outside now?

Doctor: No. No, they're gone now. Karen is heating the baby's formula, and dinner is almost ready. You'll have something to eat, won't you?

Laura (*very drowsily*): Well . . . perhaps . . . Could you find . . . a blanket for the baby? She looks . . . cold.

Doctor: Of course. Johnny, see if you can find another blanket or something, will you?

John: Yeah, sure. (*Lays gun aside and goes into hallway.*)

Laura: You still . . . think it's all right, don't you?

Doctor (*warmly*): Of course I do. I'm the proudest father around, you know that. Honor is a beautiful baby.

Laura: And you like her name, don't you? (*faintly*) Honor - Honor.

Doctor: You know I do, darling.

Laura (*pause; then, faintly*): If only - things were a little different - you know.

Doctor: Everything's going to be fine, Laura, just fine. I just want you to concentrate on getting better, okay?

Laura: But - do you still think it's all right? Will we be all right?

Doctor *(patiently)*: Everything will be all right. *(He rises and moves towards the kitchen door, almost colliding with Karen at the door.)*

Karen: *(laughing)*: The coffee! Almost spilled it all over! *(She seems to be in forced good spirits.)*

Doctor: Set it down over here. Let's see. *(Looks around, then sees a crate and drags it over.)* Here, put it down here. *(The air seems strangely festive as the three pass coffee cups and sugar around.)*

Laura: Thank you, dear. *(Accepts a cup from Karen and sits up a little.)* I feel much better, better than I've felt for a week. What time is it? It gets so dark so early these days.

Karen: It's only about six. Supper's almost ready. You'll have some, won't you? Spaghetti and meatballs?

Laura: Yes, perhaps I will have some.

Karen: Oh, sure, that's great! *(almost gaily)* Can I feed the baby? The formula's ready.

Laura *(smiling)*: I suppose so. Be careful now, won't you?

Karen: I will. *(She lifts the baby carefully and takes her into the kitchen, humming softly.)*

Laura *(after a pause)*: Is Johnny still . . . looking for a blanket? He can take it into the kitchen.

John: I've got it. *(Takes it into the kitchen and returns to the couch a minute later.)* Dad, let me talk to you for a minute, will you?

Doctor: Of course. Just a minute.

(Johnny walks over to the hallway as Dr. Walker tucks the quilt under Laura.)

Doctor: There. *(Smiles.)* Comfortable now?

Laura: Yes. *(softly)* Johnny doesn't . . . approve, does he?

Doctor: Well - he'll understand someday. You mustn't worry too much about him.

Laura: But it's important to me that he understand about the baby. I - I thought he'd be happy.

Doctor: He will understand someday. (*Rises and pats her hand reassuringly.*) Don't worry. (*He slowly joins Johnny at the hallway door.*)

Doctor: Your mother is very sick, John, and very confused. I'd appreciate it if you'd act - a little more pleasant about Honor.

John (*sarcastically*): This is not going to be a very pleasant day, Dad. I just saw some men near the trees out back. They're surrounding the house, about twenty of them, and they've got guns.

Doctor (*looking at him thoughtfully*): Did you recognize any of them?

John: It's pretty dark. But I saw Bill Freely on the patio.

Doctor: Bill Freely! Treated him for rheumatism just last week. Had it bad in his hands, I remember.

John: Can he still pull a trigger?

Doctor: Hmmm?

John: Dad! Wake up, will you? (*Grips his arm.*) Dad, this time they're not going away! Can't you understand?

Doctor (*pulling away gently*): John, keep your voice down, please. Your mother's very sick and -

John (*savagely*): If she'd been in a hospital -

Doctor: You know she couldn't go to the hospital.

John (*gesturing towards the audience*): Look, what do you think they're going to do? The baby is illegal! They're going to take Honor away, if they have to bust the door down to get her!

Doctor (*irritated, but calm*): Your mother and I went to school with half the people in this community. And, for what it's worth, we have a pretty good standing in this town. Now Bill Freely and Snow Becker and all the others just aren't going to come barreling through that door. They're our friends. They're not like that.

John (*deliberately*): You are dead wrong. (*They face each other silently. Karen comes in from the kitchen; seeing them, she stares for a minute with the baby in her arms. Doctor Walker turns away.*)

Doctor: We'll talk about it later.

John: Later!

Doctor (*ignoring him*): Ready to eat, Princess?

Karen: Everything's ready. Just have to set it out. *(nervously)* What's the matter?

Doctor: Nothing. John will help you set dinner out. I'll light some more candles.

(Johnny walks angrily into the kitchen, and after a minute Karen gives the baby to Laura and follows Johnny. They reappear carrying dinner plates and begin setting them on the floor around the candelabra. Doctor Walker begins hunting around for candles.)

Karen: There's more candles in the bathroom, Daddy.

Doctor: Fine. *(Goes out)*

John *(in a low voice)*: He's a fool.

Karen *(also in a low voice, not looking at him)*: Shut up, Johnny. You're not helping things by fighting him, and you're upsetting Mom.

John: Come off it, Karen! How long do you think we can stay holed up in here? For one thing, the food's gonna run out by the end of this week. For another thing, Mom needs hospital care. She should've been in one when she had Honor.

Karen *(furiously)*: No hospital would have let her keep Honor!

John: Well, what is this hiding going to prove? They'll take Honor in the end, and you know it.

Karen *(rising, speaking through her teeth)*: Then let them fight for her. It's about time someone stood up to that Bureau of Family Planning! I'm sick of them telling everyone -

(They are cut short by a voice from offstage. It appears to be coming from a megaphone outside the front door.)

Sullivan: Dr. Walker - can you hear me? It's Sully! Vince Sullivan!

Laura *(half rising in alarm)*: What's that? Tom -

Doctor *(coming from the hallway)*: It's all right, Laura. Karen sit here. *(Johnny finds the cleaned rifle and carefully picks it up.)*

Sullivan: Tom - Tom, listen to me, for goodness' sake. *(Dr. Walker stands quietly near the candelabra.)*

Sullivan: Tom, look, we only want the baby. We don't want to hurt anyone, Tom , not you or the kids or Laura. Just give us the baby, Tom. You know we won't hurt it, just open the door. *(Dr. Walker stares thoughtfully at the floor as Johnny stations himself in front of the door and points the gun straight ahead.)*

Sullivan: Make it easy on all of us, Tom. Just let us have the baby.

Laura: No! No! *(Begins crying hysterically. Karen tries to quiet her, with little success.)*

Sullivan: Look, the governor's granted you a pardon. No one's going to arrest you.

Laura: Make them go away! Make them- *(She goes into a fit of coughing. Dr. Walker comes to life and quickly crosses the room.)*

Doctor: Laura? No, you lie back - lie back. Give her to me. *(He reaches for the baby.)*

Laura: No! *(They engage in a weak struggle.)* Give her back! She's mine-

Doctor: It's all right. No, I'm going to hold her. *(Finally succeeds in taking Honor.)* Karen, get another pillow for your mother.

Sullivan: Come on, Doctor.

Laura *(Whimpering)*: Don't let them take her. *(Johnny reaches down carefully to the untouched meal and selects a dinner roll. Then he resumes his position, feet apart, gun in the crook of his right arm. He takes a slow bite of the roll.)*

Stone: Dr. Walker, this is Inspector Stone, from Newport. *(He sounds a little embarrassed, but he goes on.)* Doctor, as a medical man, surely you understand why we have such laws on childbirth, and why you have to give the child to us. *(Dr. Walker seems not to hear. He stands holding the baby, and looking down at the floor.)*

Stone: You're a respected man in the community, Doctor. No one's going to hold this thing against you. Just give us the baby. *(Laura begins to cry softly.)*

Stone: The baby will be well taken care of, you know that. Our placement office will make sure that it gets a good home.

John *(disgusted)*: Oh wow.

Stone *(patiently)*: We're going to wait five minutes, Doctor, and let you decide. We know you'll see it our way. We'll be right here, and when you decide, you can just open the door and come out.

John: Well? What do we do, Dad? *(voice rising.)* What do we do? *(There is no response. From harsh disbelief, John changes to gentle persuasion. He takes a deep breath, puts the gun down on the floor, and slowly approaches his father.)*

John: Come on, Dad. *(He reaches for the baby.)*

Doctor *(dreamily)*: No, John. *(He moves away.)*

John: But she'll be all right. Can't you understand? We can't win, Dad. *(with an effort)* Dad, look, Honor is your third child; that makes her illegal. We have to give her up.

Doctor *(faintly)*: No - I can't.

John: Come on, Dad, before we get hurt.

Doctor: No.

John: Before Honor gets hurt. *(Suddenly Karen springs at him.)*

Karen: Why don't you just get out of here! Go on, get out! You can do what you want, but we're staying! So just get that through your fat head! *(They face each other for a long minute. When Johnny at last turns away, he has lost his patience.)*

John: All right! *(Begins throwing more crates against the door as barricades, while in the distance a siren is heard.)* So we're stayin'! Stupid, stupid, stupid!

Brad *(in a whiny, nasal tone)*: Walker, this is Phillip Braddon, from the Family Planning Bureau in Providence. I know you can hear me in there. This is doing you no good, Walker, no good at all. I've given you three days to see it our way, and my patience is worn out.

John *(to Karen)*: Pile some more junk against the back door. And keep away from the window.

Brad: Listen to me in there! You're breaking the law! And the state has the right to take the baby away after three days! Now your electricity and your water have been turned off! If we have to break in, Doctor, we will. *(Karen quietly returns from the kitchen. She has a carving knife in one hand.)*

Brad: We don't want to hurt you, Doctor, but you and your wife have broken the law, *(in a voice that rises steadily)*. Your neighbors do not appreciate this infringement upon their social rights! *(A gun goes off loudly, startling Johnny and causing Karen to jump and Laura to scream: Doctor Walker stands frozen. Immediately the roar of a large crowd is heard; someone is screaming, "Walker, Walker" outside. Red police lights flood the room.)*

Karen: Heavens, what's happening? *(Someone beats at the front door and the barricades shake. Johnny fires into the door.)*

John: Take Dad and Honor down in the cellar and keep them out of the way! *(Somewhere a window breaks and he whirls)* The bedroom -

(Karen screams as the door barricade begins to give way, and Johnny starts for the hallway. Before he gets there, two men in gas masks burst from the hallway and train rifles on him.)

1st Guard: Drop the gun, kid. Nice and easy. *(Johnny hesitates, then slowly lays the gun on the floor. Second guard circles him warily and backs him against the wall to frisk him.)*

2nd Guard *(to Karen)*: Just put the knife down, Miss, and put your hands up. *(She does so in numbed disbelief as the door barricade is shoved aside and men pour into the room. Among them is Inspector Stone, in a raincoat, and Braddon, in a business suit.)*

Brad *(curtly)*: All right, check for concealed weapons. You other men cover Walker. *(Three guards surround Dr. Walker, who has backed himself into a corner of the room with the baby in his arms. The baby begins to cry and Karen protests in fright as she is seized by two guards. Three newsmen force their way into the room and begin snapping pictures.)*

1st Newsman: Okay, get a picture of the wife. Joe, get a picture of the wife.

2nd Newsman: Ben, find me a phone, will ya? They gotta have one around here somewhere. Phone into the office.

(Confusion and noise fill the room. Red light turns everything to a bloody color. Suddenly a high, moaning cry from Laura rises over everything else and brings silence, except for one newspaperman, who has found the phone. In silence, people converge on the bed where Laura lies. The crowd parts to show Stone and Dr. Walker standing over her.)

Stone *(awkwardly)*: The strain - must've been too much for her. *(Dr. Walker stares numbly at him.)*

3rd Newsman *(into the phone)* Hold on! Hold on, will ya', I think the mother just died!

Stone: Her heart must've given out. *(awkward pause)* I'm sorry. *(everyone stands in numbed silence, even the third newsman. The sirens begin to die away outside. At last Braddon clears his throat and straightens his tie.)*

Brad: Well . . . my job is over. *(He goes to the door, then turns.)* Send the report to my office, Stone.

3rd Newsman: Mr. Braddon? Mr. Braddon? What about the baby? What happens to it?

Brad *(shortly)*: Nothing. There're only four in this family now. My job is done. *(He walks out, and after a minute the other men follow as the curtain closes.)*

POPULATION SURVEY

Population growth can be studied in several ways. One approach looks at population growth as an environmental problem. This method concerns itself with the stress being placed on the environment because of overpopulation. Another way to approach population growth is through demography. This survey uses the second approach. It includes questions for the students and a guide for the teacher to interpret the survey. Students can see how the four determiners of population density - birth rate, death rate, immigration, and emigration - actually work. From the survey, they can find out if the birth rate in their area is decreasing or if more people are moving in or out of their community. The only factor which is predetermined is the death rate, since, because of modern medicines, the average life expectancy has increased. The class should make a decision based on the survey whether their population is increasing or decreasing. This is the main purpose of the survey.

If the students would like, they can use the survey as a springboard and try to determine the consequences of population growth or decline on their community.

POPULATION SURVEY

1. Have you lived in this area all your life?

   a. If not, where did you live before you moved here?

   b. Why did your family move here?

2. Have your parents lived here all their lives?

   a. If not, where did they live before they moved here?

      Father -

      Mother -

   b. Was the place they lived in first larger or smaller than the town your family now lives in?

3. How many children did your father's parents have?

4. How many children did your mother's parents have?

5. How many children did your parents have?

6. How many children do you think you might like to have?

7. When you grow up, what do you want to be?

8. To do this job, will you have to move somewhere else?

9. Will the place you move to probably be larger or smaller than where you now live?

10. Would you like to live in a city?

    Why or Why not?

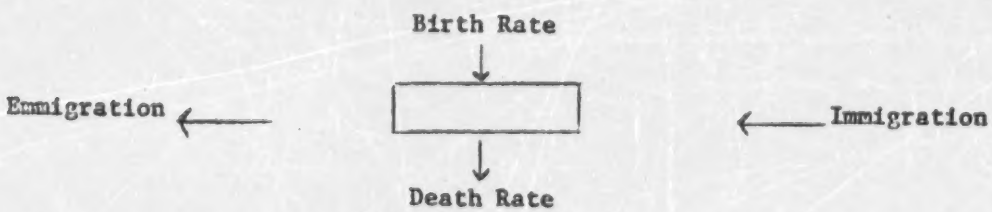
POPULATION SURVEY

Compile the results of the survey on the blackboard. (Let each child give his answer for questions 3, 4, 5, 6; add all the answers to each question and find the average. If you have enough time let the students do the adding and find the average. There is no way to compile the results to number 7.)

Use the results of the survey to discuss:

1. How many out of the class have immigrated into the area? (question 1)
2. How many out of the class will probably be moving away? (question 2)
3. Which is greater - the number moving in or out?
4. Calculate the averages for questions 3, 4, 5, and 6.
5. Does the size of families seem to be increasing or decreasing? (Compare questions 3 & 4 with 5, and question 5 with 6)
6. Why do people move from one place to another? (question 1.b.)
7. From the survey do people seem to move to larger or smaller towns? (question 2.b. and 9)
8. Do people generally prefer the city or the country? (question 10)

Put this diagram on the board -



Write the name of your community in the center. Beside each factor put a plus or a minus.

The Death Rate will always be a minus.

Try to determine whether the population of your area is increasing or decreasing. Remember:

an increase in the Birth Rate and Immigration cause the population to increase; however, an increase in the Death Rate and Emmigration cause the population to decrease.

FOOTNOTES

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40 Nelson, p. 79.

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II. Films

Beyond Conception. 35 minutes. 1968. Color. Rental $15.00/
Purchase $275.
Population Dynamics
3829 Aurora Ave., N.
Seattle, Wash. 98103

House of Man: Our Changing Environment. 17 minutes. 1965 Color
Rental $9.00/Purchase $200.
Encyclopaedia Britannica Education Corp.
Rental Library
1822 Pickwick Ave.
Glenview, Ill. 60025

Population Ecology. 19 minutes. 1964. Color Rental $9.00/
Purchase $232.50
Encyclopaedia Britannica Educational Corporation
Rental Library
1822 Pickwick Ave.
Glenview, Ill. 60025

Time of Man, The. 50 minutes. 1971. Color.
Rental $40.00/Purchase $450.
Holt, Rinehart, & Winston
Media Sales
383 Madison Ave.
New York, N.Y. 10017

Tomorrow's Children. 17 minutes. 1971 Color
Rental $22.00/Purchase $225.
Perennial Education
1825 Willow Rd.
Northfield, Ill. 60093

Too Many People. 6 minutes. 1971 Color
Rental $9.00/Purchase $85.
Cross Films
P. O. Box 5409
Milwaukee, Wis. 53211

III. Filmstrips

*1. The Ecological Crisis
Society For Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

Part 1 - Population Statistics
Part 2 - Population Trends

*2. Ecology And Man Series - Set 1
McGraw-Hill Films
Manchester Road
Manchester, Missouri 63011

Part 5 - Populations and Biomass

*3. Ecology And Man Series - Set 3
McGraw-Hill Films
Manchester Road
Manchester, Missouri 63011

Part 6 - Human Ecology

*4. Ecology: Interactions and Environments
Scott Education Division
Holyoke, Massachusetts 01040

Part 7 - Man - Hero or Villian?

*5. Ecology: Understanding the Crisis
Encyclopedia Britannica Ed. Corporation
425 N. Michigan Avenue
Chicago, Illinois 60611

Part 2 - Man in Eco-Systems
Part 3 - Human Communities Simple and Complex

*6. Environmental Crisis - Set 1
AAHPER/Publication Sales
NEA Center, Room 627
1201 16th Street, N.W.
Washington, D. C. 20036

*7. Surviving the Ecology Crisis
Society For Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

Part 2 - Overpopulation

IV. Slides

Population Reference Bureau - 35 mm, Black & White

1. "Population Challenge of the '70s." February 1970. 5 slides for $1.25.

2. "Population and Resources: The Coming Collision." June 1970. 5 slides for $1.25.

3. "India: Ready or Not, Here They Come." November 1970. 4 slides for $1.00.

4. "The Future Population of the United States." February 1970. 4 slides for $1.00.

5. "Man's Population Predicament." April 1971. 23 slides for $6.25.

6. "Toward a U. S. Population Policy." June 1971. 2 slides for $.50.

7. "Where Will the Next 50 Million Americans Live?" October 1971. 5 slides for $1.25.

V. Organizations and Agencies

1. Institute of Society, Ethics and the Life Sciencies
623 Warburton Ave.
Hastings-on-Hudson, N.Y. 10706

Report to the Population Commission on Ethics, Population and the American Tradition
Hastings Center Report - issued bimonthly

2. Planned Parenthood/World Population
810 Seventh Ave.
New York, N.Y. 10019

Write for publications and free guides to films

3. The Population Council
245 Park Ave.
New York, N.Y. 10017

Studies in Family Planning - issued monthly
Country Profiles - published occasionally
Current Publications on Population/Family Planning - bimonthly

Reports on Population/Family Planning - published occasionally
Population Chronicle - published bimonthly
(The above are available free of charge from the Councils' Information Service)

4. The Population Institute
100 Maryland Ave. N.E.
Washington, D. C. 20002

Popins - newsletter
A handbook for student population activists will be published in mid - 1972

5. The Population Reference Bureau, Inc.
1755 Massachusetts Ave., N. W.
Washington, D. C. 20036

Periodic Newsletter - free upon request
Sourcebook for Teachers on Environment and Population.
Kathryn Horsby
Teacher or Student Membership entitles recipient to all regular publications ($5.00) -
Population Bulletin
PRB Selection
Population Profile
World Population Data Sheet
Other graphics: Wall charts and slides

6. Zero Population Growth, Inc.
Los Altos, Calif. 94022

National Reporter - issued monthly for a subscription fee of $5.50/yr.
Regular Membership is $10./yr.
Student Membership including subscription of $4./yr.

7. United Nations - Economic and Social Information Unit
Room 250
United Nations, New York

8. Center for Population Education
Teachers College
Columbia University
New York, N.Y. 10027

Write for Teaching Population Dynamics: An Instructional Unit for Secondary School Students. Hazel W. Hertzberg

9. Center for Population and Environmental Education
University of North Carolina
Chapel Hill, N.C. 27514

Write for list of monograph series and other publications.
Toward a Population Education. Noel David Burleson (free)

10. International Population Program
McGraw Hall, Cornell University
Ithaca, N.Y. 14850

(Professor Joseph M. Stycos, Professor Parker Marden)

11. Department of Sociology and Social Studies Education
Florida State University
Tallahassee, Fla. 32306

(Professors Charles Nam, Byron Massialas, James Sudeen)

12. Center for Studies in Education and Development
Graduate School of Education
Harvard University
Cambridge, Mass. 02138

(Dr. David Kline)

13. Center for Population Planning
School of Public Health
University of Michigan
Ann Arbor, Mich. 48104

14. Population Curriculum Center
College of Education
University of Delaware
Newark, Del. 19711

Write for A Conceptual Scheme for Population Environmental Education and A Sourcebook for Population - Environment Action. Robert Stegner and Val Anmsdorf.

15. Environmental/Population Studies
Huxley College
Western Washington State College
Bellingham, Wash. 98225

(Professor Irwin Slesnick)

16. Office of Population Affairs
Department of Health, Education and Welfare
Washington, D. C. 20201

17. Center for Population Research
(Behavioral Sciences)
National Institutes of Health
Bethesda, Md. 20014

18. Office of Environmental Education
Department of Health, Education and Welfare
400 Maryland Ave., S. W.
Washington, D. C. 20201

19. Bureau of the Census
Public Information Office
Department of Commerce
Washington, D. C. 20233

* These materials are available at:

Environmental Education Center
13 Veterans Drive
Oteen, North Carolina 28805